14th Annual Governor's Pollution Prevention Awards

October 27, 2000
The Hyatt Lisle

Hosted by:
The Illinois Waste Management & Research Center,
a division of the Department of Natural Resources

14th Annual Governor's Pollution Prevention Awards

The 2000 Governor's Pollution Prevention Awards are presented to honor businesses and organizations in Illinois that have successfully reduced the generation of wastes. These can include toxic air contaminants, wastewater, infectious wastes, plus hazardous and other industrial process wastes. By recognizing the outstanding pollution prevention achievements of these organizations, it is our hope that others will be encouraged to join this effort to help both the environment and the economy. It has been shown that by adopting pollution prevention strategies businesses can increase the efficiency of their operations, reduce their impact on the environment and save money.

Since 1987, the Illinois Waste Management & Research Center has worked with the Governor's Office to recognize outstanding pollution prevention efforts in our state. Categories in the Governor's Pollution Prevention Awards include small, medium and large industries, trade organizations, vendors/suppliers, communities, educational institutions, service organizations and continuous improvement.

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2000 Governor's Pollution Prevention Award Winners

Vendor/Supplier Category

Arbortech Corporation

The Arbortech Corporation in McHenry manufactures membrane filtration technology that is being utilized in a number of pollution prevention projects involving companies in the State of Illinois. Membrane filtration physically separates such contaminates as fat, oils, grease, suspended solids, bacteria and certain viruses from the waste stream. The treated water contains water and chemicals that are smaller than the membrane pores. This material is recycled into process operations, thus reducing cleaning consumption and water usage at the facility.

Prior to the installation of membrane filtration equipment, some of these companies discharged process solutions into the water system. This system has virtually eliminated these waste streams. Facilities that did not discharge their water would have waste hauled off-site for disposal, which costs more money and creates the possibility of hazardous material spills. By providing a closed-loop system, these facilities have reduced or eliminated the volume of waste material. Membrane filtration systems have saved companies money and taken hazardous materials out of the environment.

ChemNova Technologies/Northern Illinois University

ChemNova Technologies is the first spin-off company for Northern Illinois University (NIU) in DeKalb. It is designed to develop and market a single step phosphating coatings formulations developed by NIU to address industrial and commercial needs. There are two specific problems in current metals coating processes. First, corrosion-inhibiting paints rely heavily on materials that are carcinogenic and must be disposed of safely. This can cause environmental, worker safety and health problems through

emissions, wastewater and solid wastes. Secondly, the current coating technology is a multi-step process that requires considerable energy, labor and control to be effective. It represents millions of dollars in time, energy, waste production, reclamation and chemicals.

The procedure of carcinogenic-free, single-step coating developed at NIU features a self-phosphating process. An optimal amount of phosphating reagents is pre-dispersed in a paint system to form a stable coating formulation. A single coating of the paint is applied to the metal and it chemically and/or physically reacts to the metal to form a protective layer. This eliminates the need for a pre-treating phosphating line or bath. The process eliminates hazardous chemicals and saves companies money. Its has huge potential use for painting contractors, automobile part coatings, coil coating, pipeline coatings, bridge and highway facility coatings, power plant coating and military uses.

Small Industry Category

Big River Technologies, Inc.

Big River Technologies is a small Rock Island service cleaning business. Its principal service is stripping paints and plastics for industrial manufacturing companies. Big River has rejected the traditional paint and plastic stripping methods that burden landfills and wastewater treatment plants. The company uses a combination of high-tech fluidized sand bed technology coupled with low-tech caustic bath stripping and modern plastic media blasting equipment. The individual pieces of equipment work in consort to recycle and make the best use of the chemicals, fluids, and energy.

Big River Technologies renders approximately 250,000 pounds of paint and plastic solids per year into about 10,000 pounds of non-

hazardous, recyclable by-product. One hundred percent (about 3,000 gallons a day) of process water is recycled at Big River. The process nets no sludge to be sent off-site. The sand mixture used in the process is used many times over, and the plastic media is recycled 12 or 15 times. Big River feels that its stripping operation would not be feasible without the benefits of waste reduction. The company estimates it saves more than $170,000 in material costs, downtime, energy consumption and reduced regulatory work.

Chilo Manufacturing & Plating

Chilo Manufacturing & Plating (CMP) was on the Metropolitan Water Reclamation District of Greater Chicago's (MWRDGC) *"Worst Violators List"* for exceeding discharge limits for many years. CMP has focused its efforts on recovery and recycling of chemicals from wastewater streams, redesign of equipment, reduction in toxic chemical consumption and redesign of the waste treatment and pollution control systems. Known high-risk causes of water pollution have been identified and either eliminated or substantially reduced through equipment purchases, chemical substitution and batch processing.

While Chilo's plating production rate increased by 70% in 1999 - its total water usage decreased by 3% (compared to 1998 adjusted for production increase). These efforts resulted in a reduction in process water usage of 7,000 gallons per day and an effluent discharge reduction of more than 6,000 gallons per day. Chilo also reduced its other process liquid wastes from 8,520 gallons in 1998 to zero in 1999.

Chilo has now been in 100% compliance with the MWRDGC limits since December 1998. Chilo could have closed its doors under the pressure to clean up. Instead, the company invested about $2 million dollars to improve its metal finishing operation to remain open, thereby saving 50 needed jobs in an economically depressed Chicago neighborhood.

Lansing Cleaners

Lansing Cleaners is a third generation operated dry cleaning facility in Lansing. The company has been involved in a variety of energy saving measures. It installed the first commercial Carbon Dioxide (CO2) dry cleaning machine in the United States. This reduced the hazardous waste stream by 95% over conventional cleaning methods. The new CO2 machine consumes a "greenhouse" gas, requires 40% less energy, and there is no heat loss from the machine.

Lansing Cleaners also has placed reflective materials under its flourescent lamps and reduced the number of tubes in each fixture, which gave the same amount of light while reducing the number of bulbs and ballast by 50%. "Energy smart" power controllers are used to cut power consumption on motors. Lansing Cleaners uses heat-insulating paint on its equipment, roof, boiler and plates to reduce heat loss. Hot pipes were insulated, which reduced steam consumption and increased the efficiency of the water chiller. Since implementing these measures, the company has maintained its energy consumption at its 1982 level while doubling its business.

Medium Industry Category

Burgess-Norton Manufacturing Co.

Burgess-Norton Manufacturing Co. Plant One is located in Geneva. It is a manufacturer of carbon steel piston pins and carbon steel shafts serving automotive, agricultural and other industrial markets. The plant has implemented a continuous process improvement effort to reduce waste generation. The projects Burgess-Norton has undertaken include:

- Recovering condensate that previously was pumped to the wastewater treatment plant and returning it to the boiler.
- Installing electronic controls on rinse tanks that reduced the wastewater generated by 52%.

- Combing three waste streams into one process tank so the stream is self-neutralized without adding any raw material. The stream is then pumped through a pressure filter and the solids are disposed of as a non-hazardous waste.
- Converting from sulfuric acid in large drums to bulk sulfuric acid stored in a tank with secondary containmentreducing container transport and disposal.
- Rust preventative is now recycled. This has reduced purchase of the raw material by 50%.

These efforts have saved the company thousands of dollars annually, reduced hazardous waste generated, and improved worker safety.

Norcross Safety Products LLC

Norcross Safety Products is a rubber footwear manufacturer in Rock Island. The company was able to achieve a significant reduction of pollution through the reduction in use of a solvent-based rubber adhesive and a water-based adhesive in making rubber footwear. The company also developed a system where certain rubber sole materials can be bonded together by co-vulcanization and therefore avoiding adhesive. In addition, where molded shoes are cemented with latex adhesives, the over-sprayed adhesives are being filtered to removed impurities and are being recycled. Rubber and fabric scrap materials as well as metal components are collected and reused. These efforts mean waste is not going into the water or air, and thousands of pounds of scrap material is not heading for landfills. The company also has saved thousands of dollars in the purchase of raw materials.

Norcross Safety has implemented an incentive program called "Gain Share" to encourage employee participation in pollution prevention and waste reduction activities. A committee of union and management employees reviews all the suggestions and all employees share the monetary gains from the result of employee suggestions. The company has given out $430,000 based on 216 suggestions in the last two years.

Large Industry Category

ADM Railcar Repair Facility

The Archer Daniels Midland (ADM) Railcar Repair facility is located in Decatur. The facility refurbishes about 400 railcars each year. Historically, railcars have been painted with solvent-based paints and these solvents were released to the air as the paint dried. Spent solvents have been recycled at the facility for years, but this recycling left behind a treatment residue which must be transported and disposed of as hazardous waste. The facility voluntarily began to explore new, low solvent paints. Through experimentation, new durable paints that are effective in protecting the railcars from corrosion and abrasion were discovered. The paint lines were completely converted to low solvent paints in 1999. Small amounts of solvents continue to be used for equipment cleaning and maintenance, but these solvents are distilled and recycled.

Actual emissions of volatile organic materials (VOM) have decreased from 49,000 pounds in 1997 to 14,900 pounds in 1999. These emissions are expected to drop by another 2,000 pounds in 2000. Hazardous air pollutants also have fallen by more the 34,000 pounds since 1997. The Railcar Repair Facility's reduction in hazardous waste generation has resulted in direct cost savings of some $20,000 per year. There also are savings in the quantities of solvents required for application of the paint and indirect man-hour savings to the company.

Continental General Tire

Continental General Tire of Mount Vernon began installation of new automatic tire building machines in 1998. Information from the parent company in Germany indicated that the machines required use of a solvent based lubricant applied to the sidewall of the tire to allow it to move on and off of three cylinders. It was soon discovered that due to difference in tire specifications in the

United States, a different sidewall formulation was needed. It became obvious that unless a non-solvent lubricant could be found, the controlled emissions would exceed 40 tons per year.

Continental General adopted the philosophy that rather than spend money on emission control, the same money would be better spent on developing a new system. The company developed a method of applying the lubricant as a spray instead of a solid. Not only that, but a recycle system was added to collect the overspray and return it to the hot melt tank for reuse rather than create a waste. The hot melt application system has eliminated all toxic emissions. Based on projected usage, the Mount Vernon plant is saving $47,000 per year by not using the solvent. And the ability to recycle the lubricating material saves approximately $119,000 per year in raw material purchase cost. The environmental benefit is that the project eliminated about 100 tons of air emissions per year. The process also is now being utilized in other Continental General locations, which will save additional money and pollution.

National Manufacturing Company

National Manufacturing in Sterling is a manufacturer and metal finisher of home, farm, and builder's hardware. The company has made a number of environmental process improvements including:

- Installing a "bioclean" degreasing system that uses a biological process and lower temperatures. The cleaning solution contains biodegradable compounds that lift oil, soil and fats and emulsifies them into particulates that are consumed by bacteria. This saved the company $60,000 and reduced treatment and disposal of waste by 83,000 gallons.
- Atmospheric evaporators were installed on the plating bath and a chemical change was made to allow the bath to run at a higher temperature so that evaporative recovery is possible. Now 96-99% of the available metals are captured and reused. This saved the company $200,000 in the first year and greatly reduces the amount of toxic chemicals being sent to landfills.

• A project improving the galvanizing process that used caustic chemicals, was slow and had uniformity problems. Mechanical galvanizing was implemented so that surface preparation and mechanical application were put into one process. This resulted in a more uniform product, cut emissions and disposal of 6,500 pounds of waste each year, as well as resulting in an annual savings of $136,000.

Continuous Improvement - Medium Category

Ethyl Petroleum Additives, Inc.

Ethyl Petroleum is a manufacturer of chemical additive products designed to enhance the performance of lubricants. The plant in Sauget produces a wide variety of detergents, dispersants, corrosion inhibitors and anti-wear products. Ethyl's continuing pollution prevention efforts include:

❖ Changing its production process so that less zinc oxide is used to neutralize acid. This change has resulted in an 85% decrease of zinc in process wastewater, which enabled Ethyl to reduce usage of zinc by more than 173,000 pounds per year. This results in a savings of $90,000 for raw materials and over $50,000 per year in waste disposal costs.

❖ Early this year, Ethyl phased out use of copper sulfate by changing a production process. More than 17,000 pounds of copper sulfate that formerly was sent to the sewer each year has been eliminated. This saves the company $25,000 per year.

❖ Reducing steam leakage - a system to track flanges, valves and fittings that are leaking has been established. Fixing steam leaks saves energy and reduces air pollution. In 1999, repairing these leaks saved 122 million cubic feet of natural gas from being burned, which resulted in a reduction of 7,500 pounds of nitrogen oxides and 300 pounds of carbon monoxide from being released into the atmosphere.

ITT McDonnell & Miller

McDonnell & Miller (M & M), a unit of ITT Industries, is located in Chicago and is a manufacturer of boiler controls. The company has taken a variety of steps in its contiunuing drive for pollution prevention:

♦ A semi-synthetic coolant was developed to improve health and safety by replacing a traditional oil-based coolant. In addition, the company built a coolant recycling system where the oil and grease can be skimmed, particulates removed, and the waste coolant turned into reusable coolant.

♦ M & M came up with a process redesign that allowed steam vents to remain unpainted and in their natural brass finish, with a cost savings of $40,000 per year. A new induction heating and soldering process was developed that eliminated any imperfections on the metal that needed to be painted over, as well as the need to bright-dip the parts.

♦ Solvent-based cleaners were eliminated and replaced with aqueous solution for parts cleaning. Raw material and waste costs were cut nearly in half, and waste containing solvents were eliminated.

♦ M & M installed programmable thermostats on all air conditioning and air makeup units to regulate building temperatures, installed timers on exhaust and pumps to shut down when not in use, and replaced all the lighting in the manufacturing areas with more efficient electronic ballast and lamps.

Stepan Company

The Stepan Company, Millsdale Facility in Elmwood has been involved in a variety of continuous improvement operations. A vacuum pump at the plant now recovers 95% of the methanol liberated in a process, and it is recycled and used as a raw material in another process. This saves 31,000 pounds of methanol per year that previously was lost to the atmosphere or to wastewater, with cost savings of $70,000 per year. The company also has reduced by 40% waste acid generated during sulfonic acid production, which saved $105,000 per year. In addition, approximately

275,000 pounds of other acids were mixed with rework sulfonic acid and converted to a product for sale. The Stepan Company also reduced sulfuric acid generated from the facility by about 60%.

In 1999, a workgroup was formed to reduce PA Residue, a hazardous waste that is generated from the process of distilling Phtalic Anhydride. The work group reduced the number of drums generated as waste by 30% through:

- Changing the procedure for pulling residue
- Better management of the product level in the residue kettle
- Heightened awareness of the operators concerning the goal of the work group
- Efficient drumming practices

Continuous Improvement - Large Category

Baxter Healthcare Corp. - Round Lake Technical Park

The Baxter Healthcare Corp Round Lake Technology Park is headquarters for the Intravenous (IV) Systems/Medical Products Division. The Technical Park consists of two manufacturing facilities for intravenous solutions, five research and development facilities and a wastewater treatment plant. Some of the continuous improvement projects include:

1. Retrofitting light fixtures, changing regulators and timers, insulating expansion lines, calibrating outside air dampers, changing the number of starts on compressors and air conditioners, and eliminating re-circulation pumps for distilled water. There was a cost savings of $175,000.
2. Investing in new industrial parts washers that utilize a non-hazardous solvent.
3. Utilizing reverse osmosis units to treat water has eliminated the use of sodium hydroxide and hydrochloric acid previously used in wastewater treatment.
4. A new technology was developed that eliminated cyanide from a waste stream.

5. Improving existing air conditioning units and replacing older units has resulted in a 21% reduction in air toxics.
6. Better control and management of materials and creation of a pollution prevention task force resulted in a 34% reduction of hazardous waste generation from the previous year.
7. Increased staff awareness and new processes throughout the technical park resulted in a 13% reduction in non-hazardous waste from the previous year.

Caterpillar Inc. - Technical Services Division

The Technical Services Division is part of the Caterpillar complex in Peoria. Caterpillar was trying to develop a process that would extend axle life on products. A new Yittrium Aluminum Garnet (YAG) laser was developed to replace a carbon dioxide (CO_2) laser that was being used. The CO_2 laser required surfaces to be painted with a black paint prior to heat treatment. This process was time-consuming, exposed employees to hazardous chemicals, and generated a hazardous waste. The YAG laser was far more efficient and generated no waste. The resulting product was better and lasted longer. Caterpillar estimates that the elimination of waste, savings on raw materials, and improvement of production costs saves $480,000 per year.

Caterpillar also has explored use of membrane filtration technology developed by the Waste Management & Research Center to extend the life of metalworking fluids. Membrane filtration can remove contaminates such as oil, metal fragments, bacteria and fungi. Use of membrane filtration technology has huge applications for Caterpillar since its Mossville engine facility alone treated and shipped for disposal four million gallons of waste coolant in 1999. Application of this technology can significantly reduce this treatment and disposal, which can save Caterpillar millions of dollars annually and prevent many contaminants from reaching the environment.

Commonwealth Edison

Commonwealth Edison, the major supplier of electrical power in Northern Illinois, is headquartered in Chicago. The utility has already done process improvements such as replacing hazardous chemicals with non-hazardous ones. Now ComEd is dedicating resources toward activities that preserve and restore the environment. It has committed $225 million for the Illinois Clean Energy Community Foundation, a program to develop and improve energy efficiency and renewable energy projects. ComEd has dedicated $6 million to purchase solar electric panels for installation throughout Chicago, including a solar power station in a former "brownfield" site. The company also is active in recovering methane gas from landfills and turning it into electricity.

ComEd continues to operate one of the worlds most successful coal ash recycling programs. So far ComEd has recycled more than one billion pounds of coal ash for use in building projects such as highway ramps, running tracks and airport runways.

The utility has developed methods to reduce chemical biocide use:

- Water is used to cool the steam used in generating electricity. Microorganisms that occur in rivers and lakes cause biological growth that can affect the efficiency of condenser equipment. Traditionally, chemicals are used to control this biofouling, but ComEd has developed a method to clean the condensers without the use of chemicals.
- ComEd's Dresden Station implemented ultraviolet (UV) disinfection in place of chemical chlorine tablets in the sewage treatment plant. The UV system is efficient and produces zero chemical discharge
- ComEd developed a method of dealing with zebra mussels at the Quad City plant without using chemicals. The company uses copper-based anti-fouling coatings to repel the mussels and other marine life.

ComEd also has a variety of company wide recycling projects involving office supplies, computers, wood chips gained in tree-trimming projects, wood pallets, ferrous and non-ferrous metals as well as other items.

International Truck and Engine Corp. (Navistar)

The International Truck and Engine Corp. facility in Melrose Park became ISO 14001 Certified in 1999. The facility switched to non-hazardous products in manufacturing and in the engine paint process; and in 1999 the plant did not generate any hazardous products in the manufacturing process. The plant reduced air emissions, and reduced non-hazardous waste 20% while increasing production. Paint nozzles are now completely cleaned with water, eliminating hazardous solvents. The three newly installed cleaning tanks never have to be dumped out; they are filtered to remove waste oil and contaminants.

The Melrose Park facility has eliminated wooden skids and wooden separators. New returnable containers are made from recycled plastic. An energy management system at the plant reduced energy costs more than $500,000 last year. The new energy system controls air compressors, heating and air conditioning systems, and boilers. It also has helped reduce air emissions and electricity usage.

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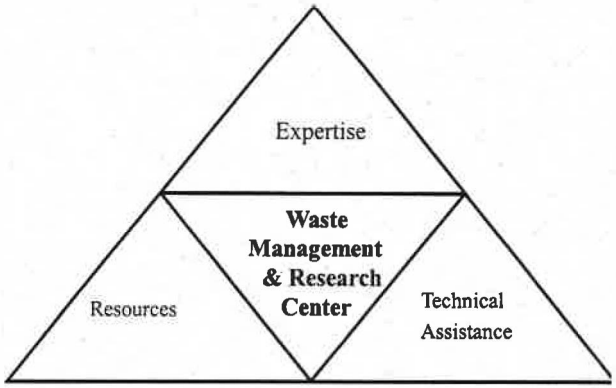

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